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ABSTRACT

The present study focuses on multiple dimensions of face-to-face marriage interaction as the basis for identifying patterns or "types" of couple relating. The research assumes that it is possible to classify marriage relationships by criteria which are objective enough to allow replication and concensus. Particular emphasis is placed on the discussion of advantages of classification and techniques appropriate for use in group classification. (VG)

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CLUSTER ANALYSIS AS A METHOD FOR DEFINING TYPES OF MARRIAGE INTERACTION*

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Introduction

There are endless ways of studying and classifying almost anything, and marriages are no exception. Typically, marriage analyses have focused on a single characteristic or variable, and there are hundreds of studies in which couples are ordered along a basic dimension such as marriage satisfaction. By contrast, the present study focuses on multiple dimensions of face-to-face marriage interaction as the basis for identifying patterns or "types" of couple relationships.

In every field of inquiry typologies or taxonomies help scholars conceptualize and bring order to the phenomena they study. In the life sciences plants and animals are classified into families, genera, species, and so on, based on relatively discrete anatomical differences. In medicine various types of diseases and illness syndromes are differentiated by their symptoms. Geologists classify rocks into various types, and meterologists identify types of clouds. The present research assumes that it is likewise possible to classify marriage relationships by criteria which are objective enough to allow replication and consensus among scholars.

The most fundamental advantage of defining types is that each type, subsuming many individual cases, is capable of accumulating or summarizing the most salient characteristics of all of the cases which are so classified (McKinney, 1966; Stinchecombe, 1968:43-47). Typologies or taxonomies thus economize and simplify the work of scientists because the study of typological characteristics, and their relations, auto-

matically subsumes many individual cases. Another advantage is that characteristics which are not part of the typing criteria can usually be better predicted from typological membership than would be the case if prediction were based solely upon single attributes (Tryon and Bailey, 1970).

There are philosophical differences of opinion about when it is appropriate to isolate types. One view about typing objects (particularly individuals or social units) is that typing should be done only with objects among which there are "natural" groupings (Fleiss and Zubin, 1969). That is, scientists should discover or find types, not create them. Another point of view does not assume that types are waiting to be found in nature, but stresses that the basic scientific problem is one of developing consensus around objective methods so that different investigators looking at an object can place it in the same location in the classification system (Reynolds, 1971; Tryon and Bailey, 1970).

Regardless of philosophical perspective, a technique used to group objects together should be capable of discovering natural clusterings if, in fact, they do exist. Consequently, the development of quantitative procedures for assessing object similarity are currently of great interest in many fields of inquiry. Such procedures are called "numerical taxonomy" in biology (Sneath and Sokal, 1973), and "pattern recognition" in several other fields. Phychologists have more often used the terms "Q analysis", "inverse factor analysis", and "profile factor analysis" to refer to techniques for assessing the similarity of individuals scored on multiple attributes (Stevenson, 1935; Burt, 1937; Ryder 1964). More

recently in the social and behavioral sciences the term "cluster analysis" has been adopted to refer to the techniques used to cluster relatively similar objects into a small number of homogeneous groups (Bailey, 1975).

There are other desirable characteristics of typologies in addition to the requirement that they be formed objectively with the capacity to detect natural types when they exist. Ideally, a typology should be capable of containing all cases--it should be exhaustive. Typological classifications should also be mutually exclusive, or if cases are "borderline", there should be a method of determining, without ambiguity, where each case belongs. Finally, and most important, the types should contain or provide the access to essential information. Methodological studies have shown that typological prediction accounts for more variance than conventional bivariate or multivariate correlation (Tryon and Bailey, 1970). Types can be informative in themselves if they reveal natural patterns or structure; alternatively, typologies can provide convenient conceptual tools, and efficient explanatory variables for objects which are not so discretely differentiated in nature. How have marriage typologies measured up to these goals?

Typologies of Marriage

Probably the most widely known typology of marriage relationships was developed qualitatively by Cuber and Haroff (1957) from in-depth interviews with several hundred middle-aged "significant" Americans. Not all of the couples studied were easily pigeonholed into one of the five types of marriage relationships, but the more serious methodological problem was not that some couples were borderline cases, but that the borders themselves were never made clear. Because the typing

criteria were not specified replication of their work is difficult. In spite of its limitations, Cuber and Haroff's typology has been extremely popular, which reflects the interest in typological assessment of marriage.

Goodrich and colleagues (1968) used three forms of data --interviewer's ratings, questionnaires, and interaction codes-- to quantitatively explore patterns of marriage in a sample of 50 newlywed couples. A separate principal components factor analysis was performed within each subset of data in order to avoid method factors, and then another principal components analysis was executed on the matrix of correlations between factors. Four aspects seemed to differentiate couple relationships at this early stage of marriage: closeness to the husband's family, closeness to the wife's family, marital problems or complaints, and marital role orientations. A "profile rotation" was then executed, resulting in 28 of the couples being classified as high on one factor and about average on the others. Because couples were only typed if they had extreme scores on one and only one factor, almost half of the couples remained unclassified, leaving out the interesting possibilities of being high on several dimensions, high on one dimension and very low on another, etc. It would be very worthwhile to consider the combinations of the various dimensions in addition to the ideal types, and thus classify all couples.

Ryder's (1970) "topography" of early marriage was based on brief abstracts condensed from interviewer's reports of joint and individual interviews with 200 couples. The two most general dimensions which seemed to differentiate husbands were impulse control or restraint, and potency or effectiveness. Wives were ordered along the three dimensions of dependency versus counterdependency, positive versus negative sexual orientation, and marriage versus non-marriage orientation. Although 21

patterns of early marriage were described by combining these dimensions, almost one-third of the couples were not classified because of what seemed to be unique or nearly unique characteristics. It should be noted that Ryder's (1970) typography of early marriage actually described types of husbands and wives, and not necessarily types of dyadic relationships.

Shostrum and Kavanaugh (1971) used a battery of self report items to identify major patterns or types of marriage relations. Couples were differentiated based on the spouses' capacity to express anger-love, and strength-weakness. The "rhythmic relationship", in which the spouses both express the polarities in a balanced fashion, was reported to be relatively uncommon. Four of the six more common types were dependent or complimentary relationships, because the individuals tried to find in their partner characteristics missing in themselves. The two other common kinds of relationships were referred to as individual or "symmetrical" because both spouses struggled against one another for control by exaggerating one polarity while denying the other. This typology of marriage relationships claimed to be empirically based but is described in qualitative terms.

Perhaps the point of greatest comparison across these typologies of marriage relationships is the common dimension of discord or conflict. This appears to be a major criterion which can be used to differentiate couple relationships. The ideas of strength of potency in the classifications of Ryder (1970) and Shostrum and Kavanaugh (1971) also appear to be somewhat similar, but both characteristics seem to be more personal than dyadic. Generally, the studies attempting to identify types of marital relationships suffer from one or more of the following deficiencies: 1) classificatory

criteria are not specified; 2) procedures for assigning couples to types are subjective and ambigious with unknown reliability; 3) types are not exhaustive or mutually exclusive. The present research will attempt to overcome these difficulties by clearly specifying the dimensions used to type couples, by using an objective typing procedure, and by typing all cases.

Procedure

Sample Characteristics

The names of couples studied here were obtained from marriage license applications in Washington, D.C. and contiguous counties as part of a large NIMH research program. The couples were telephoned to enlist their cooperation and were paid $15.00 for each night they participated in the study. All spouses were beginning their first marriage, and most were white and from middle-class backgrounds. The husbands were between the ages of 20 and 27, and the wives between 18 and 25 at the time of marriage. Some couples were seen several times during the NIMH project, but the 396 couples in the present analysis were all studied between one and three years after marriage.

Interaction Procedure

Couple interaction was studied with the Inventory of Marital Conflict, or IMC (Olson and Ryder, 1970). The IMC was developed to provide data on couple disagreement, and was patterned after the revealed difference technique developed by Strodtbeck (1951). However, the IMC attempted to overcome some of the weaknesses of the RDT through several modifications. The essence of the RDT consists of having spouses independently respond to some issue or question, comparing their responses to reveal their

differences, and then bringing the spouses together for a joint discussion or decision regarding those issues on which their difference had been "revealed." Whereas the RDT typically varies in both the number and content of the items given to couples in the joint situation (because the choice of items depends on each couple's "revealed differences"), the IMC presented every couple with the same 18 situations, so that both the number and content of the items was constant across all of the couples studied.

The IMC procedure required spouses to first read individually and respond to 18 vignettes which presented common marital disagreements. For all 18 vignettes each spouse had to decide and record on his or her individual form who was primarily responsible for the problem (husband or wife) and which of two proposed solutions was acceptable. After separately completing their individual forms, the spouses were brought together to discuss the 18 items and make a joint decision for each of the vignettes; their joint decision was recorded on a joint answer form. This individual-joint format was important because 12 of the vignettes were worded differently on the husband and wife individual forms. The 12 "conflict" items were written so that the husband's individual form presented a vignette which was slanted to imply that the wife was primarily responsible for the problem described, and vice-versa for the wife. Because their individual forms subtlely presented opposing versions of 12 of the vignettes, and in the joint situation couples no longer had the vignettes to refer back to, husband-wife disagreement usually occurred over these 12 "conflict" items.

The remaining six vignettes were considered non-conflict situations because the vignettes on the husband and wife individual forms were identical, and disagreement was not "built into" the procedure. Although the couples were told that their discussion during the IMC procedure was being tape recorded, only the microphones were visible. The completion of the individual form took about one-half hour, and the joint discussion generally about the same time, making the entire procedure about one hour in length.

Data Analysis

Data Preparation

The couples' tape recorded discussions of the IMC vignettes were prepared for analysis by coding, scoring, and analyzing the reliability of the data. By substituting numerical codes for verbal statements, two raters independently coded the husband-wife interaction sequentially onto coding sheets. Frequency scores on each interaction code were then obtained for each spouse and inter-rater and split-half reliabilities were computed for each of the interaction codes. Interaction codes were selected for analysis based on 1) how often they occurred, 2) how reliably they were coded, and 3) their theoretical salience.

Coding. The IMC coding instructions (Olson and Ryder, 1975) specified that the unit of interaction to be coded was the statement, defined as any utterance bounded at the beginning and end by another person's utterance. Such statements sometimes contained more than one sentence, but they were more elemental than "sequences", "ideas", or "themes" identified as other coding units (Riskin and Faunce, 1972).

Coding from tape recordings in the present research missed nonverbal cues in gestures and body movements (Psathas, 1961), but since the tape could be replayed there were probably fewer acts lost than when coding ongoing interaction. The procedure used should capture more subtle ffective meanings than typescript coding, but perhaps not all that might be seen in direct observation (Waxler and Mishler, 1966).

Scoring. After statements were categorized by two coders the information was transferred from coding sheets onto punched computer cards. For each couple there were then two records (one by each rater) of their statement-by-statement discussion of the IMC vignettes. A FORTRAN scoring program was written to compute the frequency and percentage scores of each code for each spouse. The two coders' scores were then added together and divided by two to get an average score for each couple. The result of scoring was a summed frequency and percentage of each kind of statement for each spouse across all of the vignettes they discussed.

Reliability checks. Reliability was assessed by comparing the coding of the two independent raters for agreement or consistency (inter-rater reliability), and by the split-half procedure, to determine how internally consistent the IMC procedure was.

Inter-rater reliabilities were computed by examining the degree to which the two coders agreed on the proportion of all statements which were placed into each of the IMC interaction categories. A more precise act-by-act inter-rater consistency was not computed (Waxler and Mishler, 1966). The inter-rater reliabilities varied considerably depending upon

the particular code. Behaviors which were most discrete (e.g., initiation, laughter, and reading) were coded with more than 95% agreement between raters. The categories coded least consistently were generally those which occurred infrequently.

The split-half reliabilities, computed by the Spearman-Brown formula, estimated how equivalent two halves of the IMC procedure were. To arrive at this coefficient, the vignettes were ranked according to the degree of disagreement they elicited, and then the items were alternately assigned to two groups. Split-half reliabilities were lower than inter-rater reliabilities for almost every code.

Selecting a subset of interaction variables. After reviewing the frequencies and reliabilities of the 29 husband and wife interaction codes, the decision was made to discard 8 of these codes. Generally speaking, these statements occurred very rarely and also had low inter-rater and split-half reliabilities. Dropping these codes resulted in a tighter, more reliable set of interaction variables, and since most of these codes were rarely used, little information was lost.

The 18 selected interaction codes are expressed as a percentage of the total couple interaction in Table 1. As shown at the bottom of the second column, the 18 codes accounted for about 93 percent of the total interaction data in the IMC procedure. The inter-rater reliabilities ranged between .64 and .98 with an average of .89, and split-half reliabilities ranged from .42 to .91, with an average of .73.

Dimensional Analysis of Variables

After the preparation of the data--coding, scoring, and checking reliability--18 interaction codes for husband and wife (36 total variables)

were selected as the data on which couples could be typed. However, typing couples on all of these interaction characteristics was unnecessary if they could be reduced to a smaller number of major factors or dimensions. It would be much more efficient if just a few major characteristics could summarize the interaction data, and couples could be differentiated and typed by their positions on these basic dimensions. Consequently, the next analysis step was a dimensional or factor analysis of the interaction variables, to be followed by a typological analysis to cluster couples together who were most alike on the major dimensions. The goal of the dimensional analysis was to locate and define a small number of theoretically meaningful interaction dimensions while accounting for as much variation as possible in the total interaction data. The process of forming the variable dimensions combined empirical and rational approaches, referred to below as "empirical key" and "preset" analysis respectively (Tryon and Bailey, 1970).[1]

Empirical key cluster analysis. One component of the BCTRY analysis system, called "empirical key" cluster analysis, provides a totally empirical approach to the identification of factors or dimensions. An empirical key cluster analysis of the husband and wife interaction variables was executed as a first step in the dimension analysis to see if meaningful dimensions were self evident in the data. The empirical key analysis, and an independent principal axis factor analysis performed using SPSS (Nie, Bent, and Hull, 1970) each revealed seven very similar factors. In each analysis three of the seven factors were simple doublets, consist-

ing of husband and wife codes of the same behavior. Because doublets are highly specific factors, it was desirable to include them in more general dimensions. This was accomplished by presetting the number of factors so that each doublet variable joined the factor on which it had the highest loading.

Preset cluster analysis of variables. Setting limits to, or "presetting", the number of factors with which the variables could load restricted the number of variable clusters and also tended to locate what were formerly doublet variables with factors where they shared the most common variance. Guided by the clusters observed in the empirical key analysis, theoretical dimensions of interest, and practical considerations, the procedure was preset to maximize variability accounted for by three factors.[2]

Several preset analyses were executed to maximize the empirical and conceptual tightness of the variable clusters shown in Table 2. This was accomplished by repeatedly presetting different variables as definers of each cluster and examining the communalities and reliabilities within the resulting variable clusters. For example, based on the empirical key analysis, partisan opinion and reiteration variables were first preset as the only definers of the second or "Opinionated Struggle" cluster. The most theoretically significant joiners of this cluster under these preset conditions were the husband and wife relevance variables, which previously constituted a doublet factor. After husband and wife relevance variables were preset as definers, both husband and wife disagreement variables also joined this cluster. The theoretical implication is

that partisan opinions and reiteration were most likely to occur when the case vignettes were relevant to the couple, and "that's just like you!" statements were made. Apparently, the more the spouses saw themselves and one another in the vignettes, the more they tended to express partisan opinions, reiterate them, and disagree with each other. Moving from the empirical to the preset analysis thus facillitated the formation of variable dimensions which were both empirically and theoretically meaningful.

The Husband Task Leadership cluster of variables included both spouses codes on initiation, reading, and asking outcome questions. The spouse who most often began the discussion of a vignette (initiation) also tended to read the most, and most often asked the other spouse what he or she had marked on the individual answer sheet (outcome question). If one spouse was high on these three task-leading behaviors, the other tended to be low. High scores on this dimension indicated husband leadership, and low scores indicated wife leadership. These six variables formed the tightest, most internally consistent variable cluster (reliability was .92).[3]

The Opinionated Struggle cluster of variables represented a dimension of interaction in which the discussion at one extreme seemed to be stalemated or deadlocked, and highly salient to the couples. Couples who scored high on this dimension were those where both spouses personalized the vignettes (relevance), expressed partisan opinions, reiterated their positions, and expressed disagreement. This variable cluster had an internal consistency reliability of .81.

The Affective Coping dimension was loosely composed of husband and wife laughter, both spouses' disapproval of each other, and husband self doubt.[4] Wife self doubt and both spouses' self assurance, which seem

to belong in this cluster conceptually, did not fit empirically with this dimension. The low frequency and reliability of the affective codes, and their weaker relation to each other, made this total dimension disappointingly low on reliability.

In the variable clusters visually represented in Figure 1, the within cluster proximity of variables--which is analogous to their inter-item reliability--can be seen. The Husband Task Leadership (HTL) cluster in the lower left of the sphere had the highest reliability (it was smallest) and the points representing variables within it were most compact. The Opinionated Struggle (OS) cluster was the next tightest, and the Affective Coping (AC) cluster, containing only five variables, was most spread out of all. The proximity of the clusters also indicated their relation to one another. As can be seen, the AC and OS clusters were not independent of each other (they were correlated .47). The correlations of HTL with AS and OS were much smaller (r = .04 and .10 respectively).

Typological Analysis of Couple Interaction

Clusters or types of couples were formed on the basis of their profile similarity across the Husband Task Leadership, Opinionated Struggle, and Affective Coping variable dimensions. Stated in distance terms, when the couples were located in a three dimensional space by their scores on the selected interaction dimensions, the couples most proximate to each other were those which had similar interaction profiles; where these similar couples were present in sufficient numbers, clusters were formed and "types" identified.

Assigning variable composite scores to couples. The point of the

variable dimension analysis was to identify salient interaction dimensions on which couples could be scored and compared. After the three dimensions were defined, every couple was scored on each of the variable composites. The scores assigned were a simple sum of the standardized scores of the variables in each cluster. These composite or cluster scores were transformed into standard score form, having a mean of 50 and standard deviation of 10. A couple with a score profile of 48, 50 and 51 on Husband Task Leadership, Opinionated Struggle, and Affective Coping had roughly average scores on all three dimensions. A score profile of 65, 78, and 38 on the dimensions described a couple in which the husband had a strong tendency to lead out, the couple was unusually high in opinionated-struggle behaviors (almost three st ndard deviations above the mean), and they were relatively low on the general affect codes.

Partitioning score space and identifying trial O-types. The "condensation method" of O-analysis (Tryon and Bailey, 1970) began by partitioning and cross classifying the variable dimensions to create arbitrary sectors of score space. The score space was first partitioned by trichotomizing each variable dimension, cutting at one standard deviation above and one standard deviation below the mean. With standard scores of 50, low sectors on each dimension were those below 40, middle sectors were between 40 and 60, and high sector scores were above 60. The number of score sectors in the three dimensional space was three cubed, or 27 cells. At one extreme a sector represented a score area where couples were low on all three interaction dimensions. One of the adjoining sectors was that area defining couples low on two dimensions, but moderate

on the third, and so on to the opposite extreme of the score space in which a sector's boundaries divided off a space where couples would be high on all three dimensions. The result of trichotomizing each dimension was a three dimensional score space partitioned into 27 cells which defined all theoretically possible couple score profiles. (See Figure 2).

Each couple's scores on the variable dimensions were then converted to a single point in this three dimensional score space, making it a simple matter to determine how many couples were "in" each of the sectors according to their dimension scores. Initial O-types were declared in cells where at least 2% of the 396 couples were located. Most of the initial O-types were in the middle sectors on at least two of the three dimensions. Some cells contained no couples: there were no couples who were low on the HTL, OS, and either low or high on AC.

Distance fitting couple points to closest O-types. Several problems remained after identifying initial O-types based on cell frequencies as described above. Some couples were not included in a cell containing a cluster at all; that is, in partitioning the score space and identifying couple clusters based upon frequencies within cells, some couples were in cells where there were not enough other couples to justify an initial O-type (as illustrated in the upper left cell of Figure 2). Even if couples were identified with an initial O-type, they might have been barely across sector boundaries from couples they were even more similar to. If only the property space approach was used, then "natural" clusters of couples might be divided by the arbitrary partitions, and one natural cluster might be treated as two or three separate types (as illustrated by the cluster on the left side of Figure 2). Consequently, there needed to be a distance sensitive procedure by which such couples could be joined

to the cluster of couples they were most like (those they were nearest to in score space).

The Euclidean distance approach to making judgments about similarity and difference between objects is a simple and elegant way of handling these problems. A small distance coefficient between points in score space indicates that their profiles are similar, and larger distance values between points indicates greater dissimilarity. Thus, the D measure of distance provides a means by which couple profiles can be efficiently compared in three dimensional score space.

The distance sensitive procedure first computed the centroid coordinates of the initial property-space O-types, then the sectors or partitions were "erased", and each of the couple points in score space was allowed to join the trial O-type it was nearest to (as measured by distance from centroids). Couples were thus assigned or reassigned to the trial O-type whose centroid was the smallest D value away from them--sometimes across the original but arbitrary sector boundary.

After the first iteration, the O-type centroids usually changed somewhat because some couples joined or left the clusters. Consequently, O-type centroids were recomputed and all couple points were once again reassigned. This procedure continued in an iterative manner until there was no further leaving and joining, and the couples were clustered into groups which included other couples who were most like themselves on the defining interaction dimensions. That is, the O-type which a couple joined was nearer in score space than the centroid of any other O-type.

Although the procedure began by arbitrarily sectioning the score space and identifying core O-types by cell frequencies, during the distance

sensitive analysis couples joined and left the O-types so that the trial O-type centroids gravitated toward centers of score density. During the iterative process two trial O-types could merge if their centroids became similar enough, thus establishing centers of natural score density.

Couples with highly unusual interaction profiles (and hence, not proximate to other couples in three dimensional score space) were not clustered into any O-type. The criterion of uniqueness excluded a couple from being typed if their D value was greater than one standard deviation away from the centroid of all O-types. Although a couple's interaction was judged to be unique by this criterion during a given interation, the couple could rejoin a cluster if it subsequently came within the closeness criterion.

The characteristics of the nine types of marriage interaction created by the condensation procedure described above are summarized in Table 3. The number of couples is given for the initial O-types and after fitting couple points to centroids by their smallest distance coefficients. The Z values are the average variable dimension scores of all couples within a type, and the homogeneity (H) coefficient is a measure of within-cluster tightness or profile similarity.[5] The overall H coefficients listed in the last column of Table 3 show that some of the nine types contained couples with very similar interaction profiles (especially O-types 4 and 9) whereas other clusters contained couples whose profiles were relatively less similar (O-types 3 and 8).

In order to better grasp the differences and similarities between the nine IMC O-types created by this method of cluster analysis, the profiles of every couple within each O-type were plotted in Figure 3. The three vertical lines in each grid represent the HTL, OS, and AC dimensions with

means of 50 and standard deviations of 10. The numbers of top of each grid are the O-type means on the respective dimensions.

The profiles shown in Figure 3 are generally grouped into internally tight types which are distinct from each other. In the lower right hand corner of Figure 3 the profiles of couples with very unusual interaction styles are drawn. The unique couples are generally within two standard deviations of the HTL mean, but on the OS dimension several are four or more standard deviations above the mean, and on the AC dimension some couples are even more unusual. The homogeneity values given in Table 3 are visually apparent in the relative tightness of O-type 4 as compared with the more spread out profiles in O-type 8.

Discussion

The profiles plotted in Figure 3 show that the couples in the first interaction type were far below the total sample mean on all three interaction dimensions. These couples were strongly wife-led (initiation, reading, and asking outcome questions), low on opinionated struggle (little partisan opinion, reiteration, disagreement, and relevance), and low-keyed in the affective domain (little laughter, disapproval and self doubt). These type 1 couples might be termed "Wife-led Disengaged".

Type two couples tended to be wife-led in interaction and low on the struggle dimension like type 1 couples. However, Type 2 couples were slightly above average on the affective dimension, departing from the passive disengaged style of type 1 couples. Couples who struggled little with the wife leading out, but who were expressive might be referred to as "Wife-led Congenial".

Type 3 couples were not only strongly wife-led like Type 1 couples, and expressive like type 2 couples, but they were also unusually opinionated strugglers. These couples were especially high in expressing partisan opionion, reiteration, disagreement, and relevance, and are aptly described

as "Wife-led Confrontative".

Type 4 couples, who were more husband-led than average, were low on the opinionated struggle dimension and also on general affect. Like Type 1 couples, type 4 couples interacted in a rather passive and low-keyed style, but unlike the wife-led type 1 couples, type 4 couples were "Husband-led Disengaged".

Type 5 couples were moderate on all three interaction dimensions. Average husband vs. wife leadership for type 5 couples was the same as for the total sample, and this relatively shared leadership style, along with moderate assertiveness on the struggle dimension and moderate expressiveness in the general affect domain convey an impression of couples whose interaction style is generally "Cooperative".

Type 6 couples tended to be husband-led in their interaction, slightly less assertive than average, and very expressive on the affective codes. This style of couple interaction might best be described as "Husband-led Expressive".

Type 7 couples were also husband-led, but these couples were highest of all on the opinionated struggle dimension. Except that the husband tended to lead out rather than the wife, this interaction style was similar to type 3; both of these interaction styles were characterized by moderate affective expression and very high opinionated struggle, but type 7 couples were "Husband-led Confrontive".

Type 8 couples were husband-led and confrontive like type 7 couples, but type 8 couples were also highly expressive on the average, as measured by verbal disapproval, laughter, and expressions of self doubt. Although the homogeneity of the type 8 general affect dimension was somewhat low, type 8 couples appeared to be "Husband-led Conflicted".

Type 9 couple interaction was characterized by husband leadership and moderate assertiveness and affect. The overall shape of this profile is quite similar to type 4, but their levels are different. While type 4 and 9 interaction styles were both husband-led and included many couples, type 9 couples were moderate on assertiveness and expressivity; this pattern of interaction might be labelled "Husband-led Conventional". (Table 4 summarizes the names and interaction characteristics of the nine types).

The typology of marriage interaction described above goes beyond previous marital typologies in a number of significant ways. Several advantages arise from the objective method used to cluster couples together based on their interaction similarities. First, the distance sensitive approach is capable of revealing natural clustering tendencies of the data so that types are not defined arbitrarily. Given the same data, other researchers could replicate the types of marriage interaction we have described, and, of course, the characteristics of objectivity and replicability are crucial in the scientific analysis of any phenomena.

Relatedly, we are able to determine numerically how unusual or common a given type of marriage interaction is . Couples in which the husband tended to lead out and interaction was relatively passive and low-key (type 4) or mutually assertive and expressive (type 9) were very common. Couples in which the husband led out and where there was high opinionated struggle and expressiveness were relatively unusual (type 8), as were wife-led couples who struggled considerably (type 3).

The types defined are mutually exclusive, but not exhaustive in the present analysis. The interaction of 15 couples did not fit any type, and

these couples were considered "unique". However, in the BCTRY program the definition of uniqueness is under the control of the analyst; all couples could have been included in one of the types, but there would then have been considerably less homogeneity within interaction types.

The most essential characteristic of a typology is that it contain or provide access to important information. The typology of marriage interaction we have described contains descriptive information about the ways husbands and wives interacted in a series of common marital situations, and the typology is additionally useful in that it enables us to predict to other characteristics of the couples. That is, knowing the interaction type tells us something about other characteristics of the couple as well. Part of this advantage is based on the procedure's ability to compare the couples on multiple dimensions. The typology is not based on only a single dimension, or on the dimension where the couple scored highest, but on the combination of characteristics across three dimension. A forthcoming article will demonstrate that typological prediction has greater power in predicting couple characteristics than single variable prediction or even more conventional multiple regression.

Although the typology of marital interaction which has been described is considered to be an important step in the right direction, we need to recognize some of the limitations of this particular data set. First, the typology describes interaction styles of young married couples. We would like to know, other things being equal, how the number of couples within types would change if older married couples were also studied, either cross sectionally or the same couples over time. Second, the typology is based on interactional data, and the types developed most accurately describe types of marital interaction, which are not necessarily the same as types of

marriage relationships in a more global sense. Third, couple interaction was initiated by the Inventory of Marital Conflict in a laboratory setting; we would like to know how the interaction types would change if the data were collected with a different stimulus, or without a stimulus, under more natural conditions. With respect to the dimensions of interaction studied, leadership and struggle characterize all interaction and their inclusion was intuitively and empirically appealing, whereas the affect dimensions was less empirically justified. In the most conservative sense, we have presented only a typology of young married couple interaction, collected with the IMC under laboratory conditions, utilizing the dimensions of leadership, struggle, and affect. The degree to which our typology of marital interaction represents the general marriage experience is an empirical question which we, and we hope others, find interesting and important enough to pursue with additional studies.

TABLE I

FREQUENCIES AND RELIABILITIES OF THE
18 SELECTED IMC INTERACTION CODES

	Interaction Codes[1]	Average Frequency	Average Percent[2]	Inter-Rater Reliability[3]	Split-Half Reliability[4]
1	Initiation	17.9	4.5	.98	.90
2	Laughter	16.8	4.2	.94	.82
3	Outcome question	14.0	3.5	.85	.84
4	Procedural comment	15.6	3.9	.78	.55
5	Reading	47.0	11.9	.97	.91
6	Content information	57.4	14.5	.93	.69
7	General information	8.5	2.1	.64	.69
8	Relevance	19.8	5.0	.95	.75
9	Disclosure	33.3	8.4	.96	.70
10	Partisan opinion	39.3	9.9	.89	.61
11	General opinion	43.8	11.1	.89	.79
12	General suggestion	6.0	1.5	.82	.70
13	Reiteration	3.8	.9	.68	.45
14	Agreement	31.9	8.0	.92	.64
15	Self assurance	3.2	.8	.85	.57
16	Disagreement	7.6	1.9	.84	.52
17	Disapproval of spouse	1.2	.3	.69	.74
18	Self doubt	3.3	.8	.90	.42
	TOTALS & AVERAGES	280.4	93.2	.89	.73

[1]These final codes were sometimes a composite of two or more elemental codes (e.g., process and outcome disagreement codes were combined).

[2]Average percent of total couple interaction (husband code frequency plus wife code frequency divided by total frequency of all codes). Husband and wife reliabilities combined.

[3]Average agreement between raters on the proportion of statements coded into each interaction category with husband and wife reliabilities combined.

[4]Vignettes ranked according to amoung of disagreement elicited, every other vignette assigned to alternate halves; corrected Spearman-Brown Formula, husband and wife reliabilities combined.

TABLE II

CLUSTER ANALYSIS OF 18 IMC INTERACTION VARIABLES

PRESET AS DEFINERS OF THREE DIMENSIONS [1]

Clusters of Interaction Variables	Oblique Factor Loading	Commu-nality	Average r with Definers	Cluster Reliability
Husband vs. Wife TASK LEADERSHIP				
W Initiation	-98	96	77	92
H Initiation	98	96	77	
W Reading	-87	78	68	
H Reading	80	68	63	
W Outcome Question	-60	43	47	
H Outcome Question	47	30	37	
OPINIONATED STRUGGLE				
W Partisan Opinion	81	67	47	81
H Partisan Opinion	79	65	46	
H Relevance	60	37	35	
W Relevance	58	35	34	
H Reiteration	53	31	31	
W Reiteration	48	25	28	
W Disagreement	44	23	25	
H Disagreement	42	20	24	
AFFECTIVE COPING				
H Laughter	50	26	20	50
W Disapproval	47	28	19	
H Disapproval	47	24	18	
W Laughter	32	11	13	
H Self Doubt	23	10	09	

[1]Decimals omitted in all columns.

Figure 1. Spherical Analysis Diagram of Three Variable Clusters from the Inventory of Marital Conflict.*

* Proximity of variables in the sphere represents their empirical similarity-dissimilarity; cluster reliability given in parentheses.

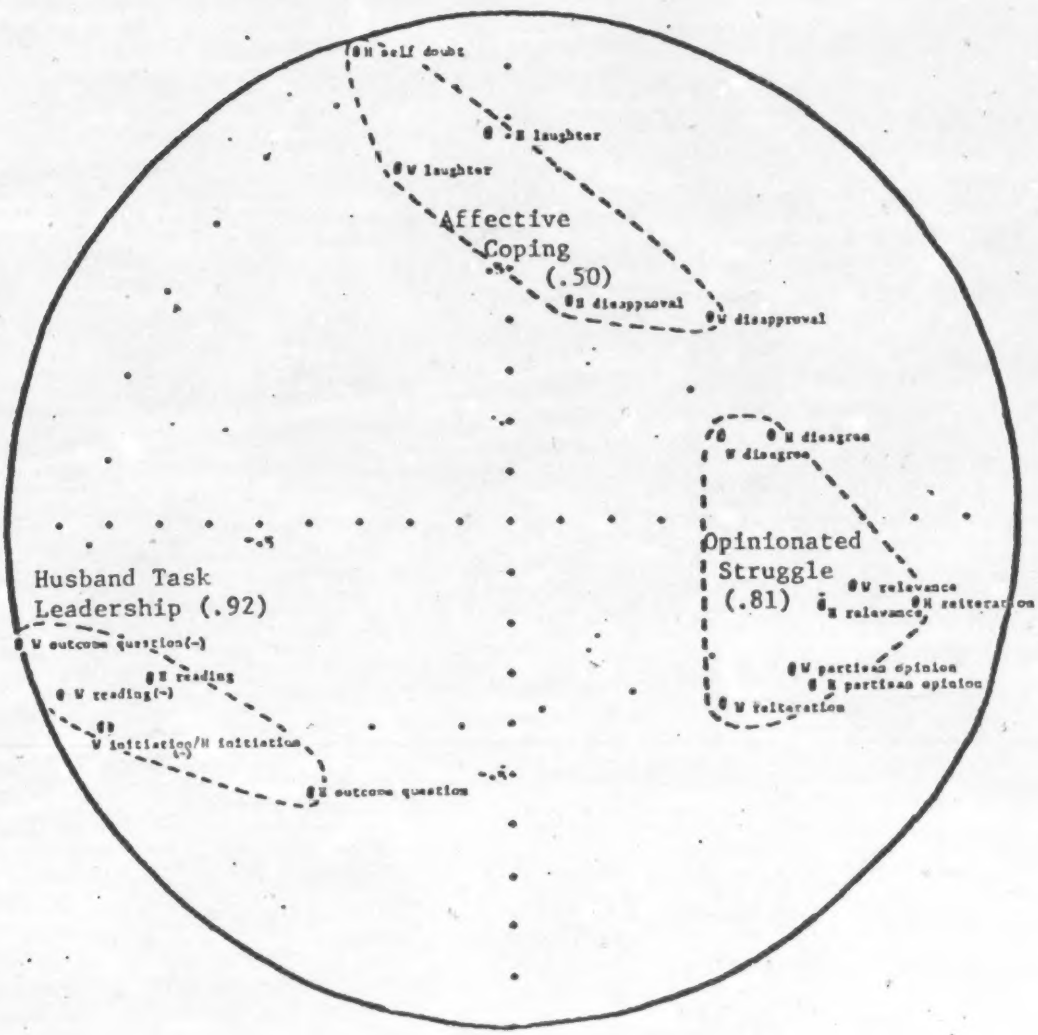


Figure 2. Three Dimensional Score Space Initially Used to Identify Types of Couple Interaction (hypothetical clusters represented).

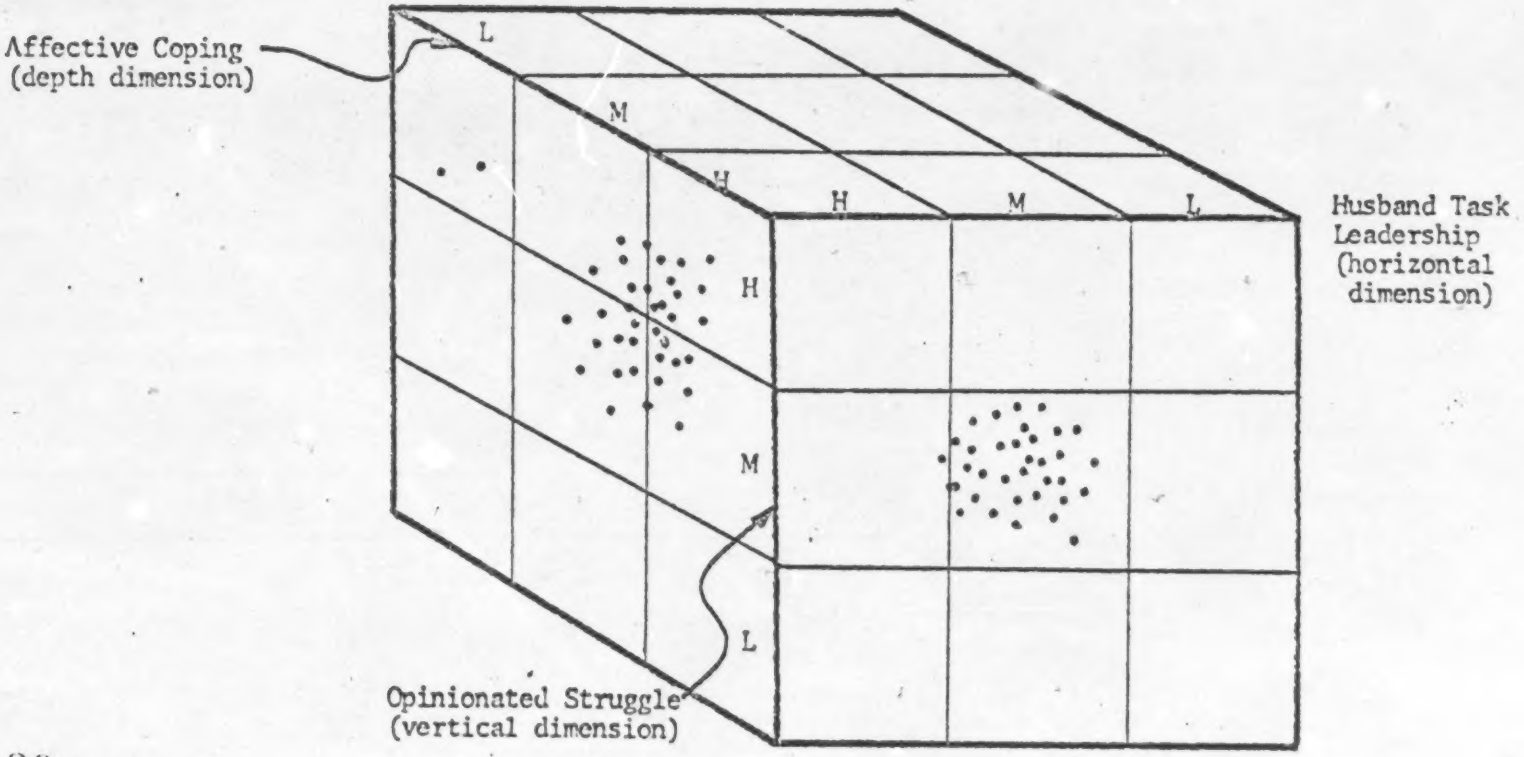


TABLE 3

CHARACTERISTICS OF NINE IMC COUPLE INTERACTION TYPES
FORMED BY CONDENSATION CLUSTERING

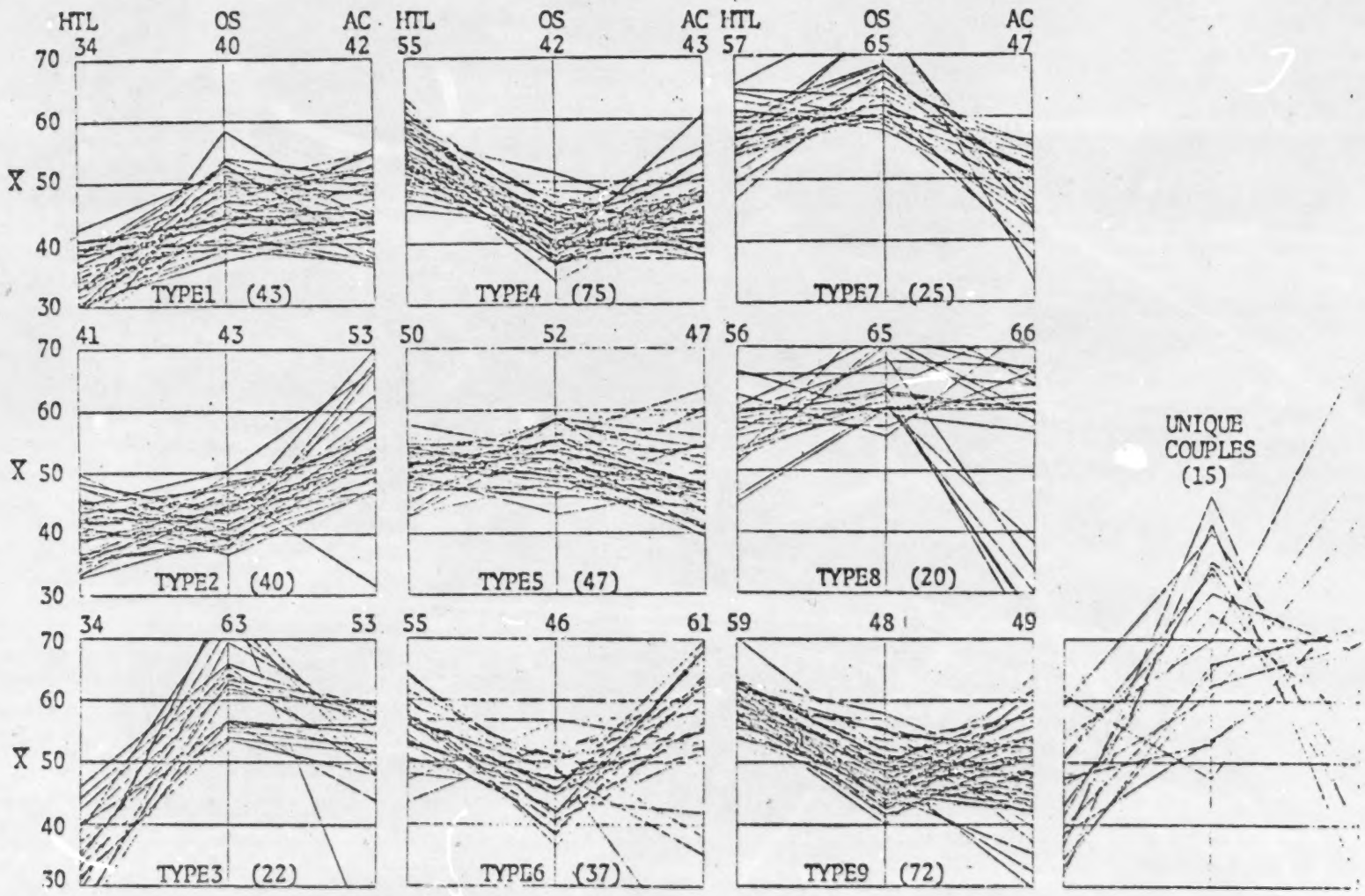
OTYPE	Descriptive Characteristics[1]	Number of Couples[2]		Profile Levels and Homogeneities[3]						Overall Homogeneity
		Initial Cells	After D-fit	Husband Task Leadership		Opinionated Struggle		General Affect		
				Z	H	Z	H	Z	H	
1	LOW HTL, low OS, low GA	10	43	34	.88	40	.87	42	.89	.88
2	low HTL, low OS	44	40	41	.88	43	.93	53	.90	.91
3	LOW HTL, HIGH OS	9	22	34	.78	63	.79	53	.85	.81
-	low OS	30	0	(merged into O-type 5)						
4	low OS, low GA	30	75	55	.93	42	.94	43	.93	.93
5	moderate	151	47	50	.94	52	.93	47	.88	.91
6	HIGH GA	20	37	55	.89	46	.89	61	.86	.88
7	high HTL, HIGH OS	21	25	57	.89	65	.88	47	.87	.88
8	high HTL, HIGH OS, HIGH GA	13	20	56	.83	65	.76	66	.83	.81
9	high HTL	33	72	59	.96	48	.92	49	.93	.94
	Unique		15							

[1]Capitalized modifiers indicate that the type mean on a dimension was more than one standard deviation away from the total sample mean.

[2]Number of couples is given for the arbitrary score sectors formed by trichotomizing each variable dimension, and after couple points in the three dimensional space were joined to the nearest type centroid by their smallest distance coefficient.

[3]Z values are the average variable dimension scores of the couples within a type, based on a standard score mean of 50 and a standard deviation of 10. The homogeneity coefficient (H) is a measure of similarity within the type, based on within-cluster variance compared to total sample variance.

Figure 3. Nine Types of Couple Interaction Condensed from 396 Profiles Plotted on Vertical Dimensions of Husband Task Leadership (HTL), Opinionated Struggle (OS), and Affective Coping (AC).*



* Dimension scores are Z-scores with a mean of 50 and standard deviation of 10.

Table 4. Names of Nine IMC Interaction Types Based on Couple Scores on Three Dimensions

Cluster Scores	INTERACTION DIMENSIONS		
	I. TASK LEADERSHIP	II. OPINIONATED STRUGGLE	III. AFFECTIVE COPING
High	Husband Leadership	Opinionated Strugglers	Highly Expressive
Medium	Shared Leadership	Mutually Assertive	Expressive
Low	Wife Leadership	Passive Coexistence	Low Key

TYPE:

1 WIFE-LED DISENGAGED; (n=43; 10.8%)
Wife Leadership (34)*, Passive Coexistence (40),

2 WIFE-LED CONGENIAL; (n=40; 10.1%)
Wife Leadership (41), Passive Coexistence (43), Expressive (53)

3 WIFE-LED CONFRONTIVE: (n=22; 5.5%)
Wife Leadership (34), Opionated Strugglers (63),

5 COOPERATIVE: (n=47; 11.8%)
Shared Leadership (50), Mutually Assertive (52),

4 HUSBAND-LED DISENGAGED: (n=75; 18.9%)
Husband Leadership (55), Passive Coexistence (42),

6 HUSBAND-LED EXPRESSIVE: (n-37; 9.3%)
Husband Leadership (55), Mutually Assertive (46), Highly Expressive (61)

7 HUSBAND-LED CONFRONTIVE: (25; 6.3%)
Husband Leadership (57), Opinionated Strugglers (65), Expressive (47)

8 HUSBAND-LED CONFLICTED: (n=20; 5.5%)
Husband Leadership (56), Opinionated Strugglers (65), Highly Expressive (66)

9 HUSBAND-LED CONVENTIONAL: (n=72; 18.1%)
Husband Leadership (59), Mutually Assertive (48), Expressive (49)

UNIQUE COUPLES: (n=15; 3.7%)

* z-score with $\bar{x}$=50, SD=10.

FOOTNOTES

1. Tryon and Bailey's (1970) package of computer programs known as "BCTRY" was used to execute the cluster analyses described in this paper.

2. From the review of literature it seemed that some measure of conflict in the relationship, affect, and an assessment of process power or leadership in the interaction would be desirable. The major practical consideration in presetting three clusters was the much greater difficulty involved in representing more than three dimensions. Consequently, three dimensions were preset around the variables which seemed to be the best definers of task leadership, conflict or struggle, and affective behaviors.

3. This was partially due to the artifactual correlation of husband and wife initiation: These variables were not independent of each other in the sense that couples were only scored once for who began a vignette. If a husband initiated 12 of the 18 vignettes his wife could only initiate the other 6. However, when wife initiation was deliberately removed from this cluster the internal consistency remained above .80. Despite the somewhat inflated intercorrelations and reliability, and the important point is that a cluster of variables was defined which provided a composite measure of the couples' husband-relative-to-wife task leadership.

4. There were not positive and negative poles to this affective dimension, but simply more or less global "affectivity" or social-emotional kinds of behavior. This dimension and the Opinionated Struggle dimension were both composed of husband and wife interaction variables which leaded in the same direction. By contrast, Husband Task Leadership was an internal relationship measure which indicated that at the extreme of this dimension one spouse almost always initiated, read, and asked outcome questions and the spouse seldom did any of these things.

5. The H value is a function of the within-variance of the cluster scores compared to the total variance couple scores in the entire sample (Tryon and Bailey, 1970:161). If the members of an O-type had identical profiles their within-group variance would be zero and the H value equal to one. Conversely, the honogenity coefficient equals zero if the profiles within an O-type represent a random selection of the total sample profiles.

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